FCC Information and Copyright

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation.

Table of Contents

Notice

Introduction of system

This mainboard is designed to take advantage of the latest industry technology to provide you with the ultimate solution in data processing. In the tradition of its predecessors, this mainboard continues a commitment to reliability and performance and strives for full compliance and compatibility with industry software and hardware standards.

U8798 Features:

1. Contains on board I/O facilities that include two serial ports, a parallel port, a PS/2 mouse port, a PS/2 keyboard port, audio ports, USB ports and a game port.

2. Contains on board IDE facilities for IDE devices such as hard disks and CD-ROM Drives.

3. Supports the Intel Pentium ® 4 processor, a leading edge processor. Complies with PC ATX form factor specifications.

4. Supports popular operating systems such as Windows NT, Windows 2000, Windows ME, Windows XP, Novell, LINUX and SCO UNIX.

Mainboard Features

1. Features Introduction

1-1. Hardware

CPU:
1. Provides Socket-478.
2. Supports the Intel Pentium $^®$ 4 processor providing the new generation power for high-end workstations and servers.

Speed:
1. Runing at 400/533 MHz Front Side Bus frequency.
2. Supports up to 2.53 GHz CPU core speeds.
3. The 33MHz 32 bit PCI 2.2 compliant.
4. The 66MHz AGP 2.0 compliant interface supports 1x, 2x and 4x data transfer mode (only with 1.5V).

Chipset:
1. Chipset – VIA VT8754 (P4X400)/ VT8235.
2. I/O Chip – ITE IT8705.

DRAM Memory:
1. Supports 200MHz, 266MHz, 333MHz and 400MHz DDR devices.
2. Supports 64Mb, 128Mb, 256Mb, 512Mb and 1G technologies for x8 and 16 devices.
3. Max of 2 Double-Sided DDR with unbuffered / Registered (with ECC).
4. The largest memory capacity is 3 GB.

Shadow RAM:
Motherboard is equipped with a memory controller providing shadow RAM and support for ROM BIOS.

Green Functionality:
1.Supports Award BIOS ™ power management functionality.
2.Has a power down timer from 1 to 15 minutes.
3.Wakes from power saving sleep mode with any keyboard or mouse activity.

BUS Slots:
1.Contains 1 AGP slot.
2.Contains 1 CNR slot.
3.Contains 5 32-bit PCI bus slots

Flash Memory:
1.Supports flash memory functionality.
2.Supports ESCD functionality.

Built in IDE Facilities:
1.Supports four IDE hard disk drives.
2.Supports PIO Mode 4, Master Mode, and high performance hard disk drives.
3.Supports disk transfer rates up to 133 MB/second.
4.Supports Ultra DMA 33, Ultra DMA 66, Ultra DMA 100, Ultra DMA 133 Bus Master Modes.
5.Supports IDE interface with CD-ROM.
6.Supports high capacity hard disk drives.
7.Supports LBA mode.

AC'97 Sound Codec Onboard:

1. AC-LINK protocol compliance.
2. Compliant with AC'97 2.2 specification.
3. 18-bit full duplex stereo ADC, DACs.
4. SNR>95 Bb throughmixer and DAC.
5. AC-3 playback required for PVD applications.

I/O facilities:

1. One multi-mode Parallel Port capable of supporting the following specifications:
   Standard & Bidirection Parallel Port.
   Enhanced Parallel Port (EPP).
   Extended Capabilities Port (ECP).
   Normal
2. Supports two serial ports, 16550 UART.
3. Supports Infrared Data Transmission using IrDA.
4. Supports PS/2 mouse and PS/2 keyboard.
5. Supports 360KB, 720KB, 1.2MB, 1.44MB, and 2.88MB floppy disk drives.

Universal Serial Bus:

1. Supports two back panel Universal Serial Bus Ports and two front panel Universal Serial Bus Ports.
2. Supports 480 MHz USB (2.0) (optional).

Hardware Monitor Function:

1. Monitors CPU Fan Speed.
2. Monitors System Voltage (optional).
3. Monitors System Fan Speed.

Dimensions (ATX form-factor):

24cm x 30.5cm (WxL)

1-2. BIOS & Software

1.Award legal BIOS.
2.Supports APM1.2.
3.Supports USB Function.
4.Supports ACPI.

Operating System:
Offers the highest performance for MS-DOS, Windows NT, Windows 2000, Windows ME, Windows XP, Novell, LINUX, and SCO UNIX etc.

1-3. Package Contents

1.HDD Cable.
2.FDD Cable.
3.Flash Memory Writer for BIOS Update.
4.USB Cable (Optional).
5.Rear I/O Panel for ATX Case (Optional).
6.Fully Setup Driver CD.

2. Mainboard Configuration

2-1. Layout of U8798

2-2. Component Index

5V / 5VSB Selection for USB (JUSBV1)
ATX Power Connector (JATXPWR2)
5V / 5VSB Selection for KB (JKBV1)
CPU FAN Header (JCFAN1)
Back panel I/O Connectors
DIMMs (DIMM1-3)
Front Audio Header (JAUDIO1)
IDE Connectors (IDE 1-2)
CD Audio-In Header (JCDIN1)
ATX Power Connector (JATXPWR1)
AGP Slot (AGP1)
CODEC
Digital Audio Connector (JSPDIF_OUT)
Case Open (JCL1)
Clear CMOS (JCMOS1)
PCI Slots (PCI1-5)
Floppy Disk Connector (FDD1)
5V / 5VSB Selection for USB (JUSBV3)
CNR Slot (CNR1)
Front Panel Connector (JPANEL1)
System FAN Header (JSFAN1)
Front USB Header (JUSB3)
Wake-On-LAN Header (JWOL1)
Front USB Header (JUSB2)

3. CPU Configuration

3-1. CPU Socket 478 Configuration Steps:
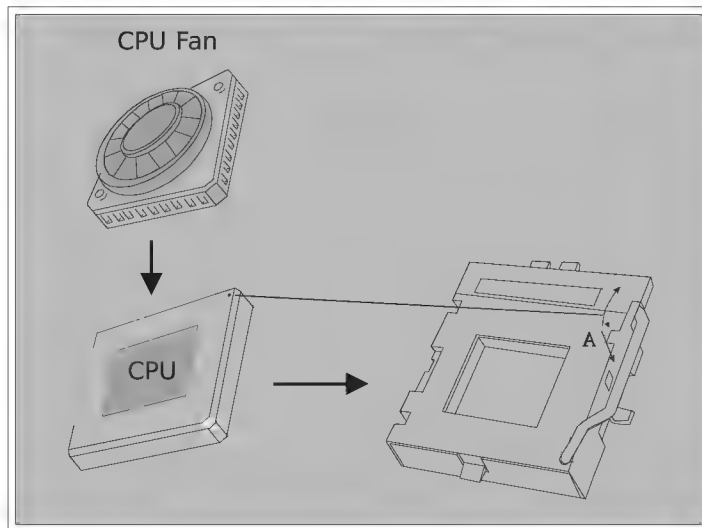
1. Pull the lever sideways away from the socket then raise the lever up to a 90-degree angle.

2. Locate Pin A in the socket and look for the white dot or cut edge in the CPU. Match Pin A with the white dot/cut edge then insert the CPU.

3. Press the lever down. Then Put the fan on the CPU and buckle it and put the fan's power port into the JCFAN1, then to complete the installation.

CPU Configuration Layout

JCFAN1

1

ITE I/O

Socket 478

CPU

P4X400

CODEC

VT8235

BIOS

BAT1

Hardware
Audio

1
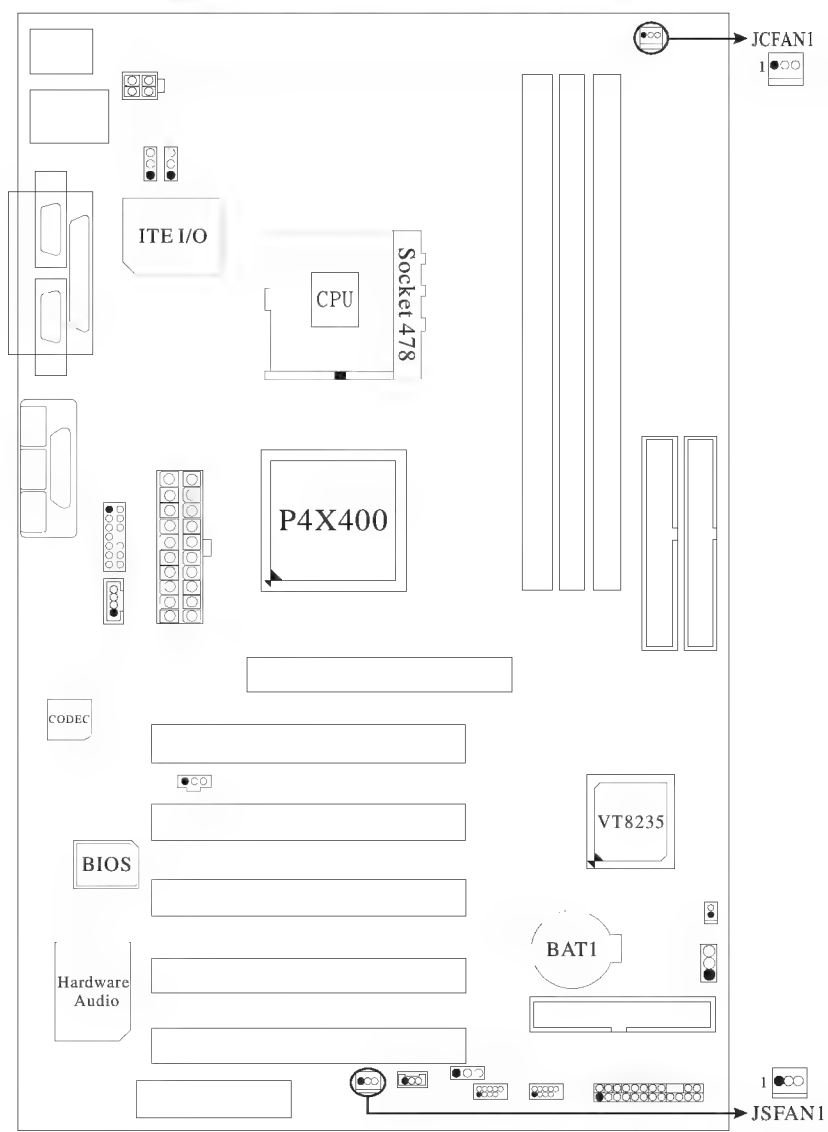
JSFAN1

3-2. CPU Fan Header: JCFAN1

Pin No.	Assignment
1	Ground
2	+12V
3	Sense

3-3. System Fan Header: JSFAN1

Pin No.	Assignment
1	Ground
2	+12V
3	Sense

4. Jumpers, Headers & Connectors

JUSBV1

JATXPWR2

JKBV1

ITE I/O

CPU

Socket 478

P4X400

IDE1-2

JATXPWR1

CODEC

JCL1

VT8235

BIOS

BAT1

JCMOS1

Hardware
Audio

FDD1

JPANEL1

JWOL1

JUSB3

JUSBV3

JUSB2
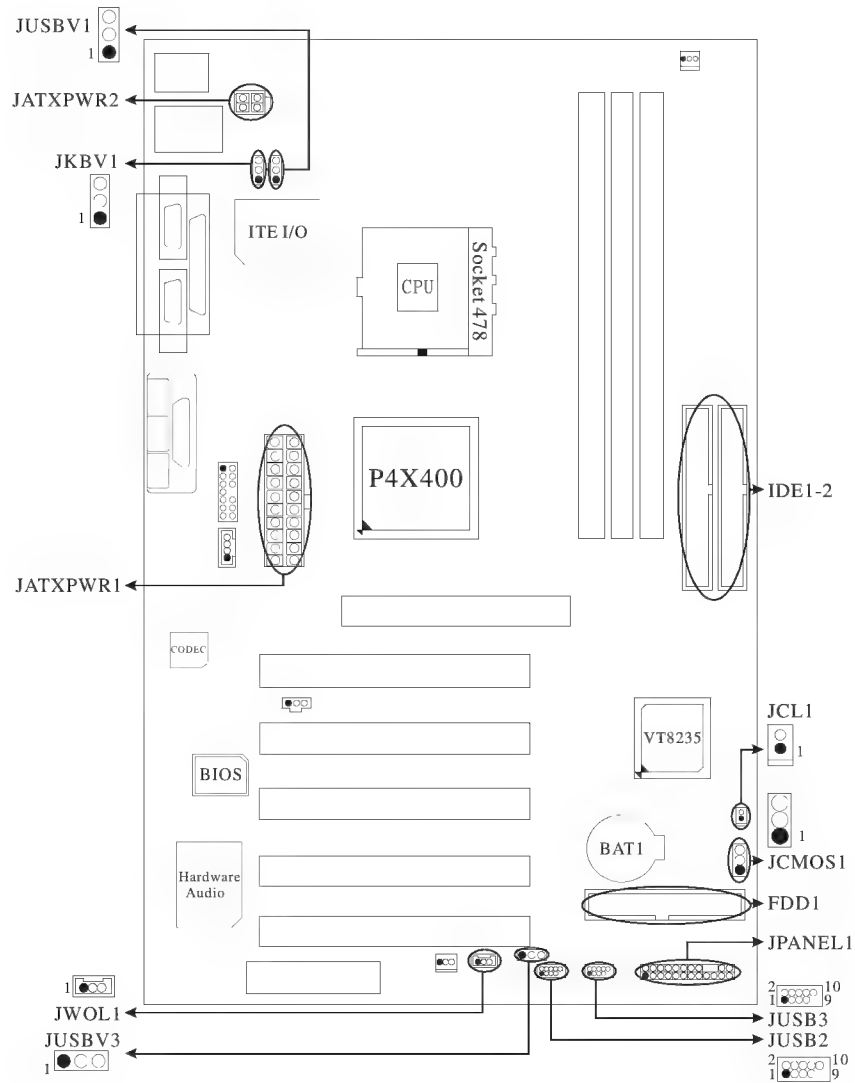
4-1. Front Panel Connector: JPANEL1

Pin No.	Assignment	Function	Pin No.	Assignment	Function
1	+5V		2	Sleep Control	Sleep
3	NA	Speaker	4	Ground	Button
5	NA	Connector	6	NA	NA
7	Speaker		8	Power LED (+)	
9	HDD LED (+)	Hard Drive	10	Power LED (+)	POWER
11	HDD LED (-)	LED	12	Power LED (-)	LED
13	Ground	Reset	14	Power Button	Power-on
15	Reset Control	Button	16	Ground	Button
17	NA		18	KEY	
19	NA	IrDA	20	KEY	IrDA
21	+5V	Connector	22	Ground	Connector
23	IRTX		24	IRRX	

SPK (Speaker Connector)

An offboard speaker can be installed on the motherboard as a manufacturing option. An offboard speaker can be connected to the motherboard at the front panel connector. The speaker (onboard or offboard) provides error beep code information during the Power On Self-Test when the computer cannot use the video interface. The speaker is not connected to the audio subsystem and does not receive output from the audio subsystem.

RST (Reset Button)

This connector can be attached to a momentary SPST switch. This switch is usually open and when closed will cause the motherboard to reset and run the POST (Power On Self Test).

POW-LED (Power LED Connector)

This connector can be attached to an LED on the front panel of a computer case. The LED will illuminate while the computer is powered on.

HLED (Hard Drive LED Connector)

This connector can be attached to an LED on the front panel of a computer case. The LED will flicker during disk activity. This disk activity only applies to those IDE drives directly attached to the system board.

IR (Infrared Connector)

This connector is used to attach to an infrared sensing device. After the IrDA interface is configured, connectionless data transfer to and from portable devices such as laptops, PDAs is possible.

SLP (Sleep/Green Button)

This connector is used to conserve energy by powering down the monitor and the hard disk when not in use. To configure this option, you need to connect a button from the front panel to this connector. Depressing the button will power down the monitor and hard drives until the system is invoked by any keyboard activity, mouse activity, modem activity or when the sleep button is depressed again. APM (Advanced Power Management) must be enabled in the system BIOS and the APM driver must be loaded.

ON/OFF (Power Button)

This connector can be attached to a front panel power switch. The switch must pull the Power Button pin to ground for at least 50 ms to signal the power supply to switch on or off. (The time required is due to internal debounce circuitry on the system board). At least two seconds must pass before the power supply will recognize another on/off signal.

4-2. ATX 20-pin Power Connector: JATXPWR1

PIN	Assignment	PIN	Assignment
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	Ground	13	Ground
4	+5V	14	PS_ON
5	Ground	15	Ground
6	+5V	16	Ground
7	Ground	17	Ground
8	PW_OK	18	-5V
9	+5V_SB	19	+5V
10	+12V	20	+5V

4-3. ATX 12V Power Connector: JATXPWR2

PIN	Assignment	PIN	Assignment
1	+12V	3	Ground
2	+12V	4	Ground

4-4. Hard Disk Connectors: IDE1/IDE2

This mainboard has a 32-bit Enhanced PCI IDE Controller that provides PIO Mode 0~4, Bus Master, and Ultra DMA / 33, Ultra DMA / 66,Ultra DMA / 100 functionality. It has two HDD connectors IDE1 (primary) and IDE2 (secondary).

- **IDE1 (Primary IDE Connector)**

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure the second hard drive on IDE1 to Slave mode by setting the jumper accordingly.

- **IDE2 (Secondary IDE Connector)**

The IDE2 controller can also support a Master and a Slave drive. The configuration is similar to IDE1. The second drive on this controller must be set to slave mode.

4-5. Floppy Disk Connector: FDD1

The motherboard provides a standard floppy disk connector (FDC) that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. This connector supports the provided floppy drive ribbon cables.

4-6. Wake On LAN Header: JWOL1

Pin No.	Assignment
1	+5V_SB
2	Ground
3	Wake up

4-7. Clear CMOS Jumper: JCMOS1

JCMOS1	Assignment
1 ◯◯◯ 3 1-2 Closed	Normal Operation (default)
1 ◯◯◯ 3 2-3 Closed	Clear CMOS Data

CAUTION WATCH YOUR STEP

The following procedures are for resetting the BIOS password. It is important to follow these instructions closely.

※ Clear CMOS Procedures:

1. Remove AC power line.
2. Make JCMOS1 (2-3) closed.
3. Wait for five seconds.
4. Make JCMOS1 (1-2) closed.
5. Let AC power on.
6. Reset your desired password or clear the CMOS data.
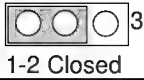
4-8. Front USB Header: JUSB3

(JUSB3)

Pin	Assignment	Pin	Assignment
1	+5V(fused)	2	+5V(fused)
3	USBP2-	4	USBP3-
5	USBP2+	6	USBP3+
7	Ground	8	Ground
9	KEY	10	NC

4-9. Front USB Header: JUSB2
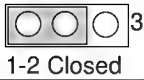
(JUSB2)

Pin	Assignment	Pin	Assignment
1	+5V(fused)	2	+5V(fused)
3	USBP2-	4	USBP3-
5	USBP2+	6	USBP3+
7	Ground	8	Ground
9	KEY	10	NC

4-10. 5V/ 5VSB Selection for USB: JUSBV1

JUSBV1	Assignment
1 ○○○ 3 1-2 Closed	5V
1 ○○○ 3 2-3 Closed	5V_SB

4-11. 5V/ 5VSB Selection for KB: JKBV1

JKBV1	Assignment
1 ○○○ 3 1-2 Closed	5V
1 ○○○ 3 2-3 Closed	5V_SB

5. RAM Module Configuration

5-1 DDR SDRAM

DRAM Access Time: 2.5V Unbuffered DDR SDRAM (without ECC) PC1600/ PC2100/ PC2700/ PC3200 Type required.

DRAM Type: 128MB/ 256MB/ 512MB/ 1GB DIMM Module(184pin)

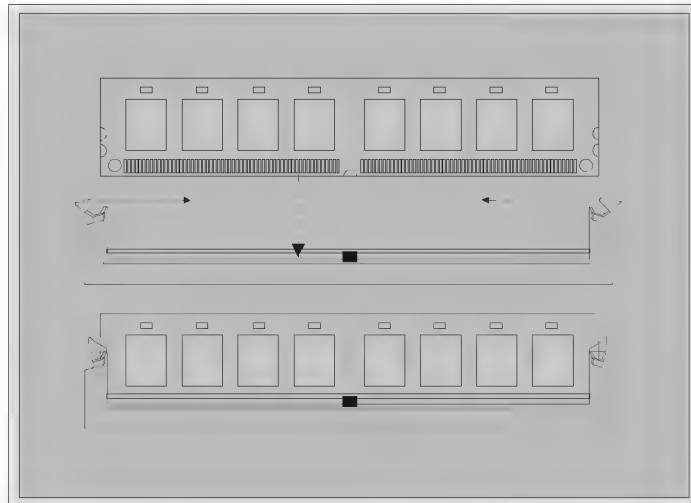### Total Memory Size with unbuffer DIMMs

(Only for reference)

DIMM Socket Location	DDR Module	Total Memory Size (MB)
DIMM 1	64MB/128MB/256MB/512MB/1GB *1	
DIMM 2	64MB/128MB/256MB/512MB/1GB *1	Max is 3GB
DIMM 3	64MB/128MB/256MB/512MB/1GB *1	

List of the status of DDR 400 already passed

	Clock	Vender	Serial No. (Chip)	Module Size	MEMTEST
1	DDR400	KINGMAX	KDL684T4AA-50	Double Size 256M x2	Pass
2	DDR400	SAMSUNG	K4H560838D-TCC4	Single Size 256M x3	Pass
3	DDR400	TwinMOS	TMD7608F8E50B	Single Size 256M x3	Pass
4	DDR400	Winbond	W942508BH-5	Single Size 256M x3	Pass
5	DDR400	Winbond	W942508BH-5	Double Size 512M x3	Pass

5-2. DIMM Module Configuration

1.   The DIMM socket has a "Plastic Safety Tab" and the DIMM
     memory module has an asymmetrical notch", so the DIMM
     memory module can only fit into the slot in one direction.

2.   Push the tabs out. Insert the DIMM memory modules into the
     socket at a 90-degree angle then push down vertically so that it
     will fit into place.

3.   The Mounting Holes and plastic tabs should fit over the edge
     and hold the DIMM memory modules in place.

6. Peripheral Port Features

JKBMS1
PS/2
Mouse

JUSB1

JPRNT1

Parallel

JGAME1

Game Port

PS/2
Keyboard   USB   COM1   COM2   Speaker Line In Mic
                                    Out   In

JCOM1   JCOM2   JSPKR1 JLIN1 JMIC1
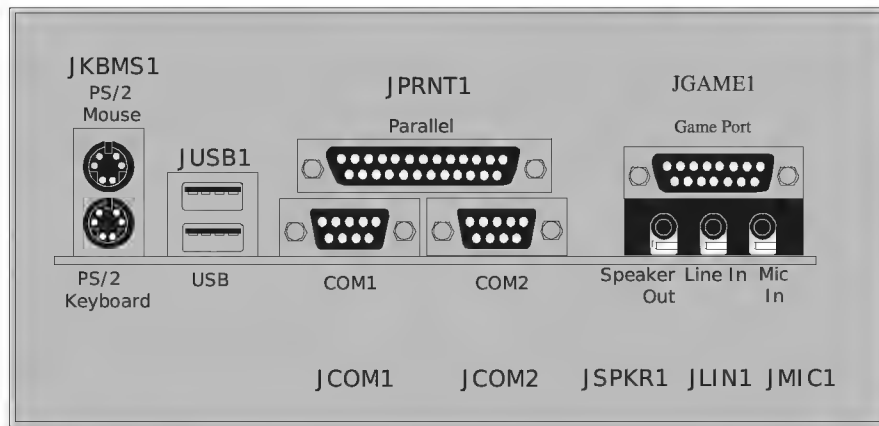
6-1. PS/2 Mouse / Keyboard Connector: JKBMS1

The motherboard provides a standard PS/2 mouse / Keyboard mini DIN connector for attaching a PS/2 mouse. You can plug a PS/2 mouse / Keyboard directly into this connector. The connector location and pin definition are shown below:

PS/2 Mouse / Keyboard Connectors

Pin	Assignment
1	Data
2	No connect
3	Ground
4	+5 V (fused)
5	Clock
6	No connect

6-2. USB Connectors: JUSB1

6-2-1. USB Connectors:
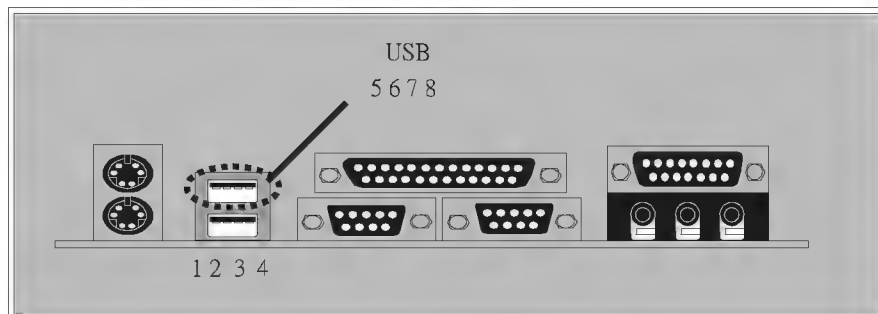
USB Connector (the below one)

Pin	Assignment
1	+5 V (fused)
2	USBP1-
3	USBP1+
4	Ground

USB Connector (the above one)

Pin	Assignment
5	+5 V (fused)
6	USBP2-
7	USBP2+
8	Ground

6-3. Serial and Parallel Interface Ports

This system comes equipped with two serial ports and one parallel port. Both types of interface ports will be explained in this chapter.

6-3-1. The Serial Interface: JCOM1/ JCOM2

The serial interface port is sometimes referred to as an RS-232 port or an asynchronous communication port. Mice, printers, modems and other peripheral devices can be connected to a serial port. The serial port can also be used to connect your computer with another computer system.

Connectivity

The serial ports can be used in many ways, and it may be necessary to become familiar with the pinout diagram. The following chart gives you the function of each pin on the 9-pin connector and some of the 25-pin connector. This information can be used when configuring certain software programs to work with the serial ports.

| Signal	Name	DB9 PIN	DB25 PIN
DCD	Data Carrier Detect	1	8
RX	Receive Data	2	3
TX	Transmit Data	3	2
DTR	Data Terminal Ready	4	20
GND	Signal Ground	5	7
DSR	Data Set Ready	6	6
RTS	Request to Send	7	4
CTS	Clear to Send	8	5
RI	Ring Indicator	9	22

6-3-2. Parallel Interface Port: JPRNT1

Unlike the serial ports, parallel interface port has been standardized and should not present any difficulty interfacing peripherals to your system. Sometimes called centronics port, the parallel port is almost exclusively used with printers. The parallel port on your system has a 25-pin, DB25 connector. The pinout for the parallel port are shown in the table below.

Pin	Signal
1	-Strobe
2	Data 0
3	Data 1
4	Data 2
5	Data 3
6	Data 4
7	Data 5
8	Data 6
9	Data 7
10	-Ack
11	Busy
12	Paper Empty
13	+Select
14	-Auto FDXT
15	-Error
16	-Init
17	-SLCTN
18	Ground
19	Ground
20	Ground
21	Ground
22	Ground
23	Ground
24	Ground
25	Ground

6-4. Game (Joystick/ MIDI) Port Connector: JGAME1

This connector allows you to connect a joystick or game pad for playing computer games. Also, you may play or edit professional music by connecting MIDI devices.
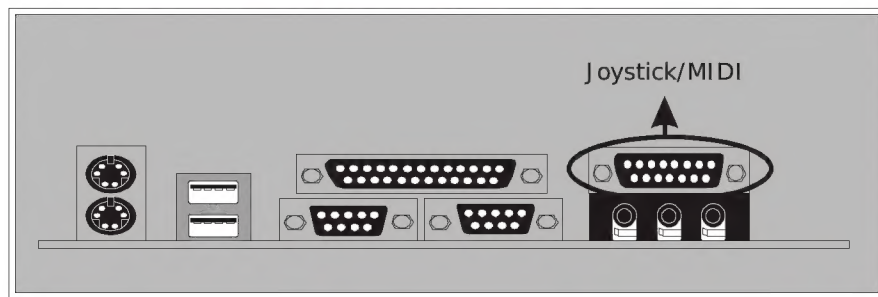

6-5. Audio Port Connectors: JSPKR1/JLIN1/JMIC1
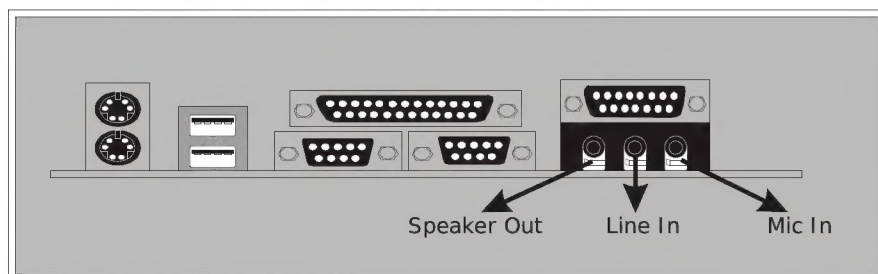
1. **Speaker Out** is used to connect speakers or headphones for audio output.
2. **Line In** can be connected to the external CD player, Tape player or other audio devices for audio input. When you use the driver to start 4 channels, Line In will change to Surround.
3. **Mic In** is used to connect a microphone, which allows you to input sounds and voices.

6-6. Audio Subsystem
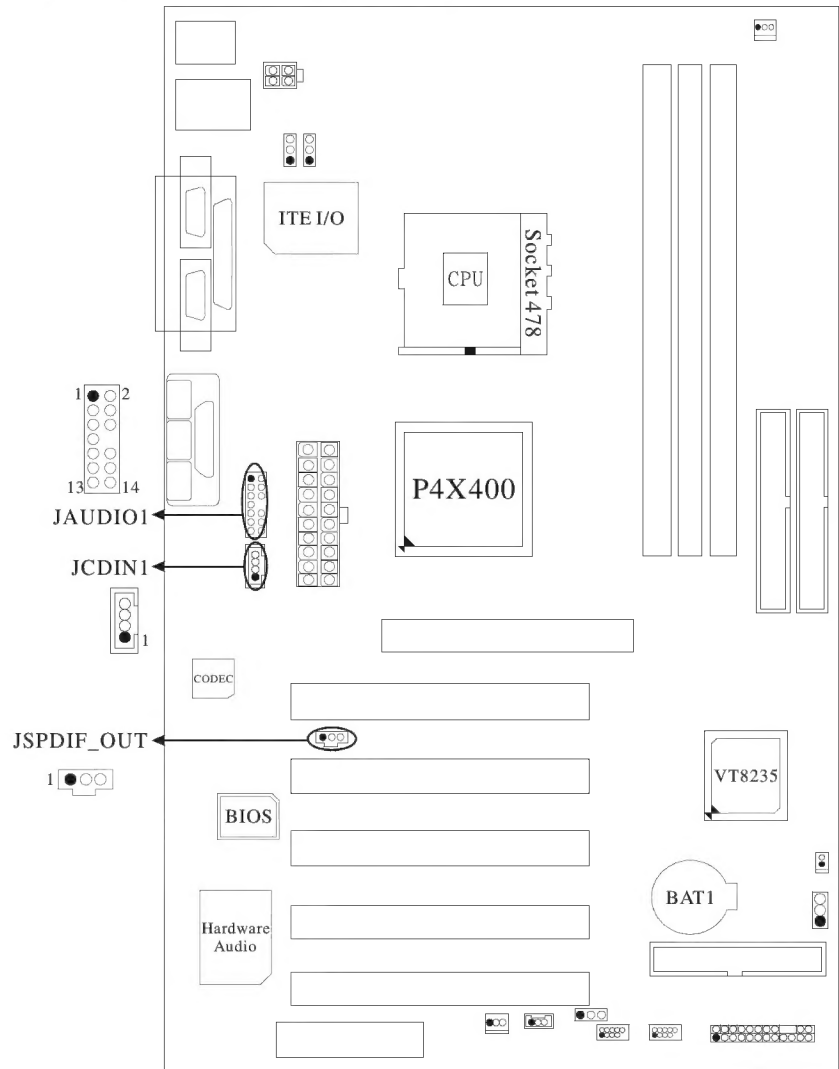
6-6-1. CD-ROM Audio-In Header: JCDIN1

Pin No.	Assignment
1	Left Channel Input
2	Ground
3	Ground
4	Right Channel Input

6-6-2. Front Panel Audio Header: JAUDIO1

Pin No.	Assignment	Pin No.	Assignment
1	Mic In	2	Ground
3	Mic Power	4	Audio Power
5	RT Line Out	6	RT Line Out
7	Reserved	8	
9	LFT Line Out	10	LFT Line Out
11	RT Line In	12	RT Line In
13	LFT Line In	14	LFT Line In

6-6-3. Digital Audio Connector: JSPDIF_OUT

Pin No.	Assignment
1	+5V
2	SPDIF_OUT
3	Ground

10/18/2002